Description and Learning Goal:

This course is a general-education (GE) course on natural disasters and how they may impact our everyday lives. We explore natural disasters and the reasons why some occur more often in some areas but not in others.

Students will learn how geologically driven disasters such as earthquakes and volcanic eruptions work, how they change our environment, and why some are more catastrophic than others. The course will illuminate what it takes for an earthquake to generate a devastating tsunami, and which other processes can cause these sea waves.

Students will learn the principal mechanisms of meteorological processes, and the conditions under which extreme weather such as major storms, tornadoes and hurricanes form. What makes Tornado Alley in the middle of the U.S. so treacherous? Despite technological and scientific advances, and tornado shelters, tornadoes in this area have not become less deadly. Why is this? A different type of storm is the hurricane which forms and sustains itself under very different conditions than tornadoes. What are these? How big is a hurricane, when is hurricane season? How long in advance can we forecast a hurricane? Why do people in the U.S. still lose their lives in a hurricane? All these questions will be addressed in SIO15.

The discussion of extreme weather also includes the causes and consequences of floods, droughts, heat waves and the conditions that lead to devastating wildfires. In the last two decades, heat waves in the U.S. have often claimed more lives than tornadoes and hurricanes in the same year. Why are heat waves so deadly? Why do wildfires in California seem to grow larger and fiercer in recent years? What triggers these fires? When and how do they blast out of control? Why do some of them become so deadly?

Changes in climate also have a large impact on the biosphere. These can be short-term events such as El Niño, or long-term such as major ice ages. Climate changes, if severe enough, can cause mass extinctions. We discuss causes of climate change and mass extinctions throughout Earth’s history. Are we really in the middle of Earth’s 6th mass extinction, and why is this?

Finally, we explore the involvement of human activity that sometimes leads to great calamities from natural disasters, sometimes despite our collective knowledge. In fact, human activity can contribute, and sometimes even cause natural disasters. In the final lectures, we will discuss Earth’s precious resources, how long it takes to build them, and how long they will last, and why it is so important to recycle and reuse.

The course has no pre-requisites. We will, however, introduce some basic principles that may look familiar from an old school physics class. Definitely not required are tough-math skills, but an interest in geography and the environment come in handy.
**Text Book:**

“Exploring Natural Disasters: Natural Processes and Human Impacts” by Gabi Laske (preliminary edition). The course material presented on the class website follows the book but the book is much more comprehensive. It should be considered mandatory and is particularly helpful for freshmen and non-science students. The book is written in a simple general style that uses the same jargon scientists use, without getting too technical. The book is also useful for anyone looking for informative reading.

**Class Website, lecture schedule and lecture resources:**

https://geowiki.ucsd.edu/sio15

The class website provides all the materials needed for this course: students will find the lecture schedule, short lecture notes that are categorized by topics, handouts for in-class note-taking, short videos on principal mechanisms relevant to each topic that may not be taught during the lectures but are nevertheless covered by the weekly for-credit tests. For each topic, the class website provides links to not-for-credit self-test quizzes for learning purposes, and to prepare for the weekly for-credit tests.

The lectures, on the other hand, will often discuss current events to relate the sometimes rather dry material on mechanisms to real-world example that happen ‘now and here’. Before each lecture is given, the most up-to-date version of the lecture slides can be downloaded from the class website.

And finally, the class website provides videos to help complete the homework assignments.

The class website is open to anyone who looks for a bit of information on natural disasters, even long after the formal teaching at UCSD is over. Because of this open access, we do not store any information on students other than their dedicated student contributions to the SIO15 student ‘witness account’ page. For everything else (e.g. student grades and for-credit tests) we use UCSD Canvas.

**Lectures – Canvas:**

Lectures are held by Prof. Gabi Laske  
MWF 3:00 – 3:50 pm

Because of the current COVID situation, lectures in January will occur through synchronous Zoom sessions. Info and access will be given through the Canvas course site. The Zoom lectures will be recorded for asynchronous learning.

Lectures in February and March will be in-person in Catalyst 0125. The lectures will be recorded via UCSD Postcast for asynchronous/remote learning.

**Contact Information:**

Gabi Laske (858) 534-8774, glaske@ucsd.edu, Canvas  
Email is the best way to communicate. Please add “SIO15” to your subject lines, using your UCSD email account and sign with your full name. Please do not use your private email addresses.
Teaching Assistants:
Four teaching assistants will help us navigate through the quarter. They will help moderate the lectures. They will also be responsible for grading the homeworks.

Homeworks and tests:
Grades are based on weekly homeworks and tests. Homeworks are due on Tuesdays. No late homework will be accepted. The homeworks will include an assignment completed during a virtual field trip to the SIO beach near the end of January.

Not-for-credit self-tests accessible through the class website will not be monitored and are for studying purposes only. It is highly recommended to use these quizzes to prepare for the for-credit tests on Canvas.

Weekly for-credit tests will be posted through Canvas and to be completed every Monday. Tests cover material of the previous week, including book chapters, lecture notes, short videos and homeworks (from the most recently released answersheet). In-class polling may be done through Zoom other similar, depending on whether we are online or in the classroom.

The grade scale is posted on the class website.
**Gradescope:**
Please register at Gradescope.com using your full name, UCSD student ID and UCSD email address. Use course entry code 4P3PXJ. Registration will ensure that your assignments and tests are properly graded, that you receive the credit and that you can check your answers.

**Field Trips:**
There will be a virtual field trip to the SIO Beach. Please check the class website for info. This trip is a MANDATORY homework assignment.

**Academic Integrity:**
Students are encouraged to work together on homeworks but each student must write a unique homework, i.e. no copying allowed. Tests are open-book but must be taken in by each student in isolation. Homeworks and tests in violation of UCSD policy on academic integrity will receive 0 points.

**Submit your personal experience:**
Natural disasters may have affected many of us. You are encouraged to discuss these in the weekly discussion sessions. In addition, you can submit stories and photos to the student photo&stories page on the class website (submit to Prof. Laske by email).